Neighborhood
Traffic Calming Program

Working together today for a safer tomorrow!

City of Harrisonburg
The City with the Planned Future

CITY OF HARRISONBURG
Neighborhood Traffic Calming Program

PURPOSE AND GUIDELINES

Background Information

Speeding and cut-through traffic has become an increasing concern to City residents and to the government agencies charged with ensuring traffic safety. Excessive speed and cut-through traffic jeopardizes both the safety and "liveability" of our neighborhoods. The Public Works Department, Harrisonburg Transportation Safety Commission and Police Department have cooperatively implemented a comprehensive Neighborhood Traffic Calming Program, which enlists community residents in helping to solve the speeding problem and improve the residential environment. The program includes the components of Educating the public, Engineering the streets and roadways, and Enforcement of laws and ordinances.

This program is adapted from the Virginia Department of Transportation's (VDOT), "Residential Traffic Calming Guide – Pilot Program 1/98 to 12/99", with input from other City programs, which has been modified to reflect the needs of the City of Harrisonburg.

The purpose of "Traffic Calming" is to address problems relating to speeding and "cut-through traffic" conditions in residential neighborhoods and on streets classified as local or residential roads. "Traffic Calming" focuses on slowing traffic without restricting movement. Certain collector streets that have many of the characteristics of local residential streets may also qualify for "Traffic Calming" measures.

This program was developed to address existing city owned streets, as well as streets that are developed as part of future subdivisions. As a result the neighborhood design process should consider a comprehensive approach to developing streets that effectively move traffic, while discouraging the use of subdivisions streets as through streets.

The process will require a significant data collection effort along with an evaluation of various remedies, education, enforcement and possibly the construction of physical devices. Consequently, the process may involve 2-3 years of study before any recommendations to install physical devices are made.

The Neighborhood Traffic Calming Process

The "Traffic Calming" program will be implemented and evaluated by the Public Works and Police Departments. The intent of this program is to resolve traffic problems starting with the least restrictive measures, and proceeding through a step by step program. The program stresses a philosophy that incorporates:

- Community awareness and education
- Enforcement
- Physical devices

Traffic Calming Measures

Community awareness and education is an important first step. The residents should be made aware of speeding concerns and should be reminded of the importance of driving safely in their neighborhood. City staff is available to speak to homeowner associations about "Traffic Calming" measures and to help raise community awareness about advantages, disadvantages, costs, and funding options.

Also, often the speeding and cut-through traffic is due to increased traffic demands on primary streets that are crowded, thus becoming inefficient to use. In most cases improvements to the primary arterial streets, and the addition of new primary streets will be the only solution to traffic congestion and routing through neighborhoods. The community must be aware of the plans, e.g., major street plan for primary street improvements, and recognize the impact on to their neighborhood with its implementation. Also, implementation and expansion of bicycle plan, and the use of public transit will reduce congestion on your street. Community support for these plans will be the most effective "Traffic Calming" measure for their community.

Education of Motorists - Motorist should be educated by providing information relating to the concerns for safety in residential areas. Information should also be provided to dispel the perception that improper short-cuts through residential streets will always save time. Origin and destination analysis conducted on streets in question is an effective method of gathering information from motorists to determine whether cut through traffic is a problem. This process is covered in more detail in the appendix.

Enforcement – Speeding problems are traditionally addressed through police enforcement. Local police officers monitor and enforce the posted speed limit. Enforcement efforts should be undertaken as much as possible prior to implementation of physical "traffic calming" measures. See Appendix for more information. Increased penalties for excessive speed is a low-cost measure that does not physically restrict driver maneuvers. A voluntary request for increased penalties will increase the awareness that speeding within the neighborhood is a serious concern and that there is community support for increased speeding fines.

Physical Devices are designed to reduce speed by creating a vertical or horizontal shift in the roadway or travel lanes, (See Appendix II for details). Because they are indiscriminate and effect all motorists, they should be used only as a last resort.

Supporting Data Requirements

1. Eligible Streets

   A. Local residential streets are eligible for "Traffic Calming" provided the posted speed limit does not exceed 25 mph. A local residential street provides direct access to abutting residences and serves only to provide mobility within the neighborhood. Traffic on these streets should be entering and exiting the residences.

   Minimum Vehicular Volumes: Eligible streets should have the larger of the following:

   1. Daily Traffic Volume greater than 500 vehicles
   2. Peak hour volume greater than 100

   The volume of traffic anticipated to be generated from the dwellings within the area the local street serves. Example; Single Family detached home is estimated to generate 10 trips per day per ITE (Institute of Traffic Engineering) standards. 50 single-family homes would generate 500 trips per day.

   B. Certain residential collector streets, although classified as collector roads, may have characteristics of a local residential street. These streets may be considered for "Traffic Calming" measures if they meet the following conditions:

   1. Posted speed of 25 mph
   2. Two-lane roadway
   3. Does not serve as the primary access to a commercial, educational, or industrial site.
   4. Minimum of 12 dwellings units fronting the street per 1000 – feet of roadway, including both sides.
   5. The volume of traffic is greater than 1000 vehicles per day.
   6. Documented Speed Problem – the 85^{th} percentile speed is greater than 10mph over the speed limit based on documented speed studies. Accordingly, the 85^{th} percentile speed is over 35 mph to qualify.

Note on Speed evaluation: It is obvious that almost everyone would like to have less and slower traffic on his or her residential street. But the reality is that certain streets are the obvious routes entering or exiting through a neighborhood. These streets cannot be expected to serve the same low traffic volumes as other neighborhood streets. It is also true that the residential 25-mph speed limit is routinely exceeded by a significant majority of drivers. Federal and State speed limit guidelines both define "reasonable speed" as that speed that 85% of the drivers do not exceed. In other words, it is the speed that only 15% of the drivers exceed. Based on wide experience, it was the staff's recommendation that the 85^{th} percentile speed of 35 mph or less on residential streets be considered as not constituting sufficient reason to consider physical devices for traffic calming actions intended to address speed. Education and Enforcement processes should be applied to these situations.

Sometimes residents' speed concerns are not based upon the 15% of drivers who might be exceeding the "reasonable range" by a few miles per hour, but by those few drivers who significantly exceed a reasonable speed. It is believed that looking at the 95th percentile speed in addition to the 85th percentile speed could provide validation for concerns in these situations. The 95th percentile speed is that speed that only 5% of the drivers exceed. Based upon the review of many residential speed surveys, it is recommended that a 95th percentile speed greater than 35 mph be utilized as an alternative threshold to considering the use of physical devices for traffic calming.

2. Cut Through Traffic – In general, traffic calming measures are not appropriate to limit traffic through a neighborhood, unless:

- The overall traffic volume is inappropriately high as based on item 1 (eligible streets), and
- If at least 40% of the vehicles in one or more of the peak hours during the day are using the street as a through street.

DEVELOPING A TRAFFIC CALMING REQUEST

Initial Steps

A group that includes representatives from the petition area, impacted area, homeowners associations, local transportation/planning staff, police, fire, rescue, and others as appropriate should develop the "Traffic Calming" plan.

A transportation audit is an engineering and planning study that makes a comprehensive evaluation of existing transportation conditions. Transportation audits look at vehicle, pedestrian and bicycle traffic as well as roadway classification, neighborhood, etc. Requests for transportation audits may be initiated by residents of a particular area. The community group shall identify the streets for which the "Traffic Calming" measures are being requested. The requests for "Traffic Calming" will be taken on first come, first served basis. All requests shall be in the from of a formal application/petition submitted on the "Request for Transportation Audit" form obtained from Public Works by calling (540)434-5928 or on the Public Works website at www.harrisonburgva.gov/trafficcalming . Each request for a transportation audit shall contain a list of signatures and addresses of residents in the affected area where a study is desired. These signatures will ensure that there is an awareness of the request among the neighbors in the area.
Because the impact of "Traffic Calming" measures will extend beyond the petition area, it is important to involve representatives from the larger, impacted area. Due to the effect physical measures may have on response time, emergency services must be included in the development of any plan.

The group of local representatives from the petition's area or the homeowner's associations will be responsible for scheduling and facilitating meetings. Most communication will be directed to the originator of the request. The originator is responsible for passing all information to

residents in the affected area. City staff and the Harrisonburg Transportation Safety Commission will provide technical support and advise the community of the potential advantages and disadvantages of "Traffic Calming" measures. Educating participants about neighborhood traffic management and "Traffic Calming" is key to a successful program.

The proposed plan should be presented to citizens at a public meeting. The results of this meeting will indicate whether community support exists for the proposed measures.

Approval and Implementation

Petition for Transportation Audit

A petition requesting a transportation audit, signed by at least 75% of the total occupied households within the petition area, must be included in the request for traffic calming. The petition area includes residences on any of the proposed study street sections, and residences on all streets that have major access onto the proposed study street section. The City will assist the community representatives in defining the petition area, and will provide the requestors with the petition form. Collector or arterial roads or major physical features typically surround the impacted area.
A petition supporting the plan will be necessary in order to verify neighborhood support for the planned improvements. The final plan and method of implementation must be reviewed by the Transportation Safety Commission and approved by the City Council. Also the final plan must have available funding for implementation through the regular CIP and Budget process.

Funding

"Traffic Calming" measures approved by the City Council will be incorporated into the Public Works budget and work plan. When a measure can be handled administratively within the current work plan and budget, it will be. More extensive or costly projects will be placed in the normal CIP and budget process and will proceed as directed by Council. The City Council has the authority to establish and/or change the priority of requested projects.
The Public Works staff will work with neighborhoods and interested parties to identify funding sources and to provide advice on obtaining project funds. Participation by the neighborhoods or interested parties will be considered in scheduling an approved project.

Evaluation

A follow-up evaluation will be performed to ensure that the "Traffic Calming" measures are effective. The City will determine the method to disseminate the findings and recommendations to those involved in the plan development, and obtain feedback as appropriate. If an unforeseen safety problem develops, the City may determine it appropriate to remove the "Traffic Calming" devices.

Traffic Volumes and Traffic Calming Measures

Traffic volumes on the residential street will determine the appropriate traffic calming measures as follows:

Fewer than 500 vehicles per day - cul-de-sac street or local residential street

Education
Enforcement

500 – 4,000 vehicles per day – through residential street

Education
Enforcement
Increased penalty for traffic violations (speeding)
Physical devices

4,000 vehicles per day – or greater – through residential street or a collector street

Education
Enforcement
Increased penalty for traffic violations (speeding)
Alternative action only – No physical devises. (Major Route Improvements)

Prioritizing Projects

Point System for Prioritizing Projects

Information is collected on streets requested for "Traffic Calming" and are evaluated based on the following process:

For a street to be evaluated one of the following must be determined:

- 40% of the vehicles in one or more of the peak hours during the day are using the street as a through street, or
- There is a speeding problem as documented by the speed study.

Qualification Scoring:

All streets must meet the requirements outlined under the section of Supporting Data Requirements - Eligible Streets, and Meet the following scoring requirements:

Criteria	Points	Basis for Point Assignment
Speed	0 to 50	85 percentile traffic speeds more than 10 mph above the posted speed (5 points assigned for every mph over)
Volume	0 to 50	Average daily traffic volumes (2 points assigned for every 100 vehicles per day)
Total Points Possible	100	

Streets with a score under 40 are not further considered for physical measures. Educational and Enforcement measures maybe considered.

Streets with a score of 40 or greater will advance to the following scoring process:

Criteria	Points	Basis for Point Assignment
Speed	0 to 50	Percentage of vehicles travelling 10 mph over the posted speed (1 point assigned for every 1 percentage point
Volume	0 to 5	Average daily traffic volumes (1 point assigned for every 100 cars over 500 vehicles per day)
Elementary Schools	0 to 10 max	5 points assigned for each school zone on the project street
Pedestrian Generators	0 or 5 max	5 points assigned for public facility (such as parks, community centers, and high schools) that generates a significant number of pedestrians on the street
Bicycle Route	0 or 10	10 points assigned if any part of the street is a designated bicycle route
Transit Streets	0 or 10	10 points assigned if any part of the street is a designated transit route
Pedestrian Facility	0 or 10	10 points assigned if there is no continuous sidewalk on at least one side of the street
Total Possible Points	100	

The qualifications and selection scores for each street segment are added together. All street segments are then compared with each other. Those with the most total points are ranked the highest.

Physical Devices for Traffic Calming

The following devices have been effective in slowing traffic in neighborhoods. To ensure minimum delay in emergency response time, the installation of speed humps and raised crosswalks is discouraged on major emergency routes. Costs are provided only as rough estimates; actual construction costs will depend on the number of devices constructed, related signing and pavement markings, and the extent of aesthetic provisions. Physical devices are shown in Appendix II.

1. **Speed Hump**
   - Description: a raised hump in the roadway with a parabolic top, extending across the road at right angles to the traffic.
   - Placement: spacing should be about 500 feet, clearly visible for 200 feet, and placed at least 200 feet from intersections; should include warning signs.
   - Advantages: reduces speed
   - Disadvantages; increases emergency response times, potential drainage problems, increases noise, increases maintenance costs.
   - Estimated Cost: $3,000 -$5,000 per speed hump

2. **Choker**
   - Description: a physical construction built at the curbside of the roadway to reduce the width of travel lane.
   - Placement: normal turning radii should be accommodated; should include advance warning signs and delineation.
   - Advantage: reduces speeds, provides parking protection, and shortens pedestrian crossing distance.
   - Disadvantages: potential drainage problems, maintenance costs.
   - Estimated cost: $4,000 - $5,000 per pair.

3. **Raised Crosswalk**
   - Description: a raised hump in the roadway with a 10-foot flat top, extending across the road at right angles to the direction of traffic flow.
   - Placement: where significant numbers of pedestrians cross the roadway; should include advance warning signs.
   - Advantages: reduces speeds, provides improved visibility and safety for pedestrians.
   - Disadvantages: increases emergency response times, potential drainage problems, increases noise, increases maintenance costs.
   - Estimated Cost: $3,000 – $5,000

4. **Traffic Circle**
   - Description: elevated area in the middle of the intersection that provides circular, counterclockwise traffic flow.
   - Placement: street grades approaching the intersection should not exceed 10 percent, and entrances should be a minimum of 100 feet away on all approaches.
   - Advantages: reduces speeds, reduces left-turn accidents, can be visually attractive.
   - Disadvantages; placement of circle may reduce parking spaces, turning radii may be reduced causing difficulty for some vehicles to maneuver, and require additional right-of-way.
   - Estimated Cost: $3,000 - $7,000

5. **Crosswalk Refuge**
   - Description: a raised median in the middle of the roadway with a cut provided for the crosswalk.
   - Placement: where a significant number of pedestrians cross the street
   - Advantages: reduces speed, provides refuge for pedestrians crossing roadway.
   - Disadvantages: increases maintenance costs.
   - Estimated cost: $4,000 - $5,000

6. **Chicane**
   - Description: alternating constrictions built curbside to create a bend in a formerly straight street, forcing vehicles to negotiate the narrowed street in a snake-like fashion.
   - Placement: should accommodate normal turning radii; sets are to be placed 400 – 600 feet apart; should include advance warning signing and delineation; used only on roadways divided with a median.
   - Advantages: reduces speed, provides parking protection, and shortens pedestrian crossing time and distance.
   - Disadvantages: limited to divided roadways, potential drainage problems, maintenance costs.
   - Estimated Costs: $5,000 - $6,000 per set.

Removal of Physical Devices

Permanent physical devices that have been installed per these guidelines, that are found to be unacceptable to the group representing the neighborhood, may have the device(s) removed by petition request as outlined under the section “Petition of Traffic Calming.”

The cost of removal of a traffic calming device and restoring the street to original condition may be the responsibility of the petitioners.

New technologies/innovative techniques

It is recognized that new technologies/and innovative techniques are being developed and the Traffic Calming issues are evaluated from current installations.

The City of Harrisonburg is receptive to new ideas and encourages suggestions. New ideas must be supported by sound engineering principals and supported by results from other installations or uses if available.

New ideas, if approved, will be installed only after the City and citizens agree that the idea will be free if a trial basis. Temporary installation must be used for the trial time, so they can be easily removed if necessary.

References

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16. Gene Arnold, VDOT Research Council, Charlottesville, Virginia
17. Traffic Calming – State of the Practice, by Institute of Transportation Engineering and Federal Highway Administration.

APPENDIX I

COMMUNITY AWARENESS, EDUCATION AND ENFORCEMENT

Community Awareness and Education

Many neighborhood traffic management programs include a community awareness and education component. This component is performed alone, as a first step before deciding to consider other actions, or in combination with other actions. A brochure has been developed for the City of Harrisonburg. Which is similar to the attached copy from Phoenix, Arizona and Virginia Beach, Virginia.

Enforcement

In addition to the traditional role of enforcing speed limits through issuing tickets, the police may also increase the community's awareness of speeding problems. An example is announcing locations for speed monitoring by radar through public service announcements (PSAs).

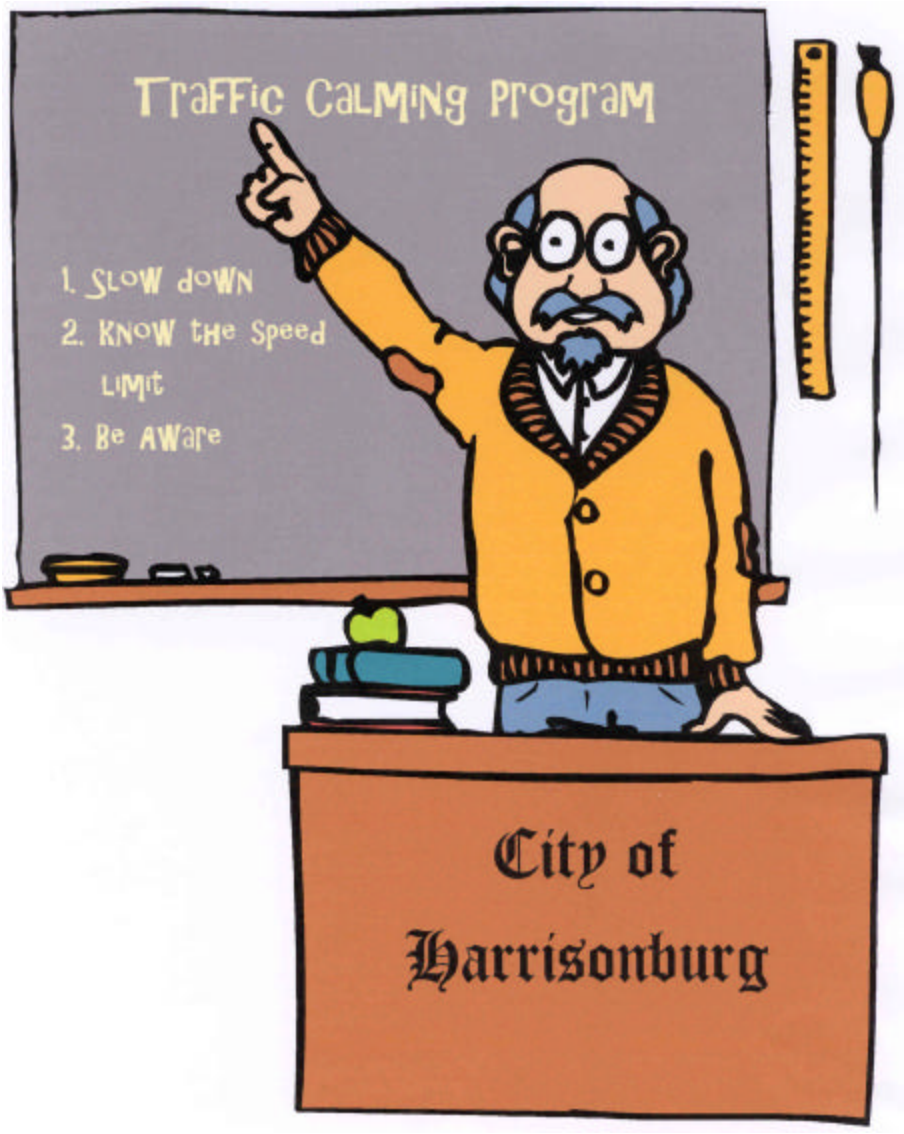
Increase Penalty

The Virginia State Code authorizes increased penalties for speeding in residential neighborhoods. A community's voluntary acceptance of increasing the maximum penalty for exceeding the speed limit to $200, will emphasize their commitment to addressing the problem. The primary focus of this program is to resolve the problems at the source, the violators.

Neighborhood Traffic Safety Program

Education
A Stage 1 Tool

Activities that inform and seek to modify driver behavior. Techniques include printed information, meetings and workshops with staff, interaction with neighbors, signing campaign, enforcement activities, school programs, parent outreach, etc.



Community Awareness

Studies have shown that motorists drive over 25 mph on residential streets. These studies also show that those who exceed the speed limit come from all age groups, not just teenagers or commuters, but everyone alike.
What does this mean? The average motorist in Harrisonburg drives faster than they should on residential streets. Why does this occur?

- Local residents drive faster on their local streets because they feel familiar and comfortable.
- Outsiders use local streets as shot cuts to busy arterial roads

For children and the elderly, this can pose a special hazard.

AS A DRIVER

HOW CAN YOU MAKE YOUR NEIGHBORHOOD STREETS SAFER?

DRIVE SLOWER
The maximum legal speed limit on residential streets is 25 mph (unless otherwise posted). Drive 25 mph or less to give yourself more time to react to the unexpected, such as a child darting out from behind a parked car. Unless you make a conscious effort, you may drive faster than you should on residential streets.
Remind neighbors to drive 25 mph. Make sure that others who use your vehicles drive 25 mph. Do not speed on major streets either, and avoid bad driving habits. Studies show that driving at a lower and more responsible speed on residential streets has very little effect on the time it takes to complete your journeys. Besides, IT IS THE LAW.

AVOID USING NEIGHBORHOOD STREETS AS SHORT CUTS
The more we use residential streets as short cuts, the more we disrupt the quality of life in neighborhoods. Neighborhood cut-through traffic increases noise and pollution in residential areas and results in a greater threat to the safety of children.

OBSERVE ALL THE RULES OF THE ROAD
Don't take chances, even on short trips. As statistics show, most accidents occur close to home. In particular, make sure you and all your passengers buckle up.

CHANGE YOUR DRIVING PATTERN ON RESIDENTIAL STREETS
Learn to adopt a different attitude! You should expect the unexpected on residential streets. It may not be your fault if you have an accident, but imagine the pain you would live with if you hit a child or elderly pedestrian. Yield to pedestrians. Pedestrians have the right-of-way at intersections whether crosswalks are painted on the street or not.

AS A PARENT

Ensure that your children know and understand the rules of the road. Our children are the primary pedestrians on residential streets and are the most likely victims of careless drivers.

Studies have shown that smaller children have difficulty in making safe judgements about traffic dangers. Do not let your children play in the street. Warn them against darting into the road after pets or toys. Teach your children to stop, look both ways, and listen before crossing streets. Make sure your children know that even though cars are supposed to stop, they may not.

SUPERVISE YOUR CHILDREN'S TRIPS TO AND FROM SCHOOL

- Plan A safe walking route to school. Walk it with your child and point out areas where they should be especially careful.
- Take or arrange for transport of smaller children to and from school.
- Set a good example, drive the speed limit and drive with courtesy. Let children off on the correct side of the road when delivering or picking them up from school.
- Ensure that your children are properly equipped to ride bicycles on city streets.
- You need to equip them with two things:
  1. Bright clothing and a safety helmet
  2. A sound understanding of the Rules of the Road

DON'T RUSH!

Do not rush while driving. Be organized and leave a little earlier. In particular, do not rush getting children to and from school. Our urgency may cause them to disregard traffic safety and run headlong across the street.

AS A RESIDENT

TAKE THE INITATIVE

If there are potential problem areas along your street let your Public Works Department staff know, such as:

- Damaged or missing signs
- Pot-holes
- Landscaping that obscures a driver's vision of signs or intersections.

TALK WITH THE HARRISONBURG POLICE DEPARTMENT

Consistent traffic problems, particularly speeding, should be reported to your local police precinct. Let them know when the problem is more prevalent so they can conduct more effective enforcement. Ask for an occasional traffic patrol to deter speeders.

GET INVOLVED AND DO YOUR PART
TO IMPROVE TRAFFIC SAFETY

ENFORCEMENT
(Visible and Active Police Presence)
A Stage 1 Tool

Periodic monitoring of speeding and other violations by police. Police officers can come out to a neighborhood for short periods of time to issue tickets. Additionally, policy officers can "take a neighborhood under their wing," and monitor traffic on a regular basis.

SPEED WATCH
(Speed Wagon/Trailer)
A Stage 1 Tool

The use of a portable radar speed meter capable of measuring vehicle speed graphically and then displaying the speed to passing drivers.

SPEED LIMIT SIGNS
A Stage 1 Tool

Signs that inform drivers of the maximum safe driving speed under normal conditions.

STOP SIGNS
A Stage 1 Tool

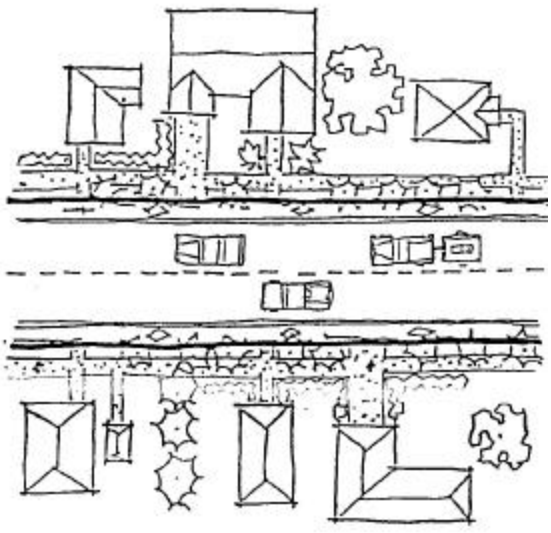
Red hexagonal signs displaying the word "STOP." These signs can be two-way or four-way and are used to designate the right of way at intersections. Stop signs should not be used as speed control in accordance with MUTCD 2B-5.

Note: [1] "A possible reason resident beliefs about the speed control effectiveness of stop signs is contrary to the findings of engineering studies is that there is some evidence that stop signs do reduce the mid-block speed of the *fastest* vehicles in the traffic stream. It is probably these fastest vehicles, rather than those traveling at the median of 85th percentile speed, that disturb residents' concerns without altering the 85th percentile or median speeds at all.

Another reason neighbors may feel stop signs to be an effective speed control device is that they perceive traffic slowing down and stopping at the controlled intersection as a real benefit, regardless of what effect the signs have on mid block speeds."
STOP SIGNS WILL NOT BE USED AS SPEED CONTROL.

STREET STRIPING
A Stage 1 Tool

Highlighting various areas of the street to increase the driver's awareness of speed or other conditions (e.g., edge of travel way to create a narrowing/slowing effect while defining space for cyclists).



[1] Homburger, Wolfgang S.; Institute of Transportation Engineers "Residential Street Design and Traffic Control," 1989.

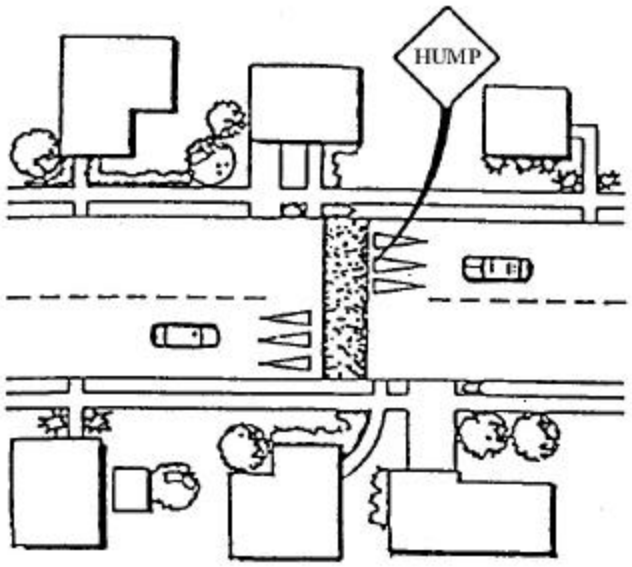
APPENDIX II

Neighborhood Traffic Calming Devices

Physical Devices

SPEED HUMPS
(ABOUT 2.67" X 12')
A Stage 2 Tool

Speed humps are wave-shaped paved humps in the street. The height of the speed hump determines how fast it may be navigated without causing discomfort to the driver or damage to the vehicle Discomfort increases as speed over the hump increases. Typically, speed humps are placed in series rather than singularly.

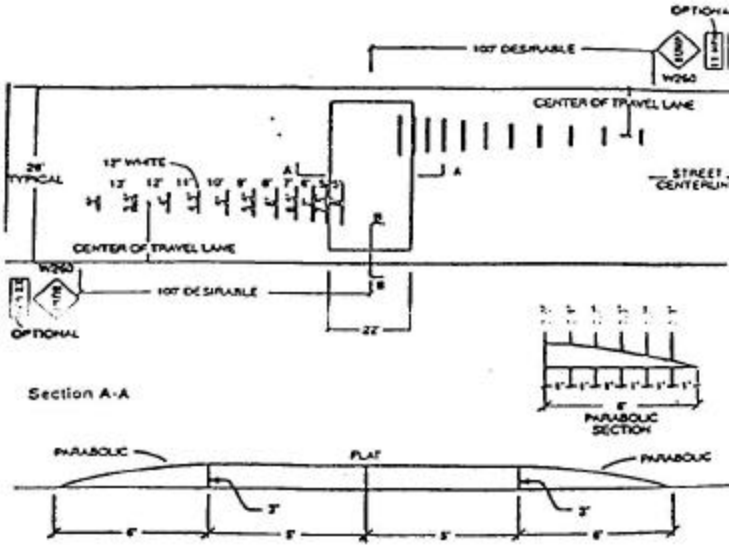


Note: Speed humps can be the most cost-effecti traffic-calming measure for reducing speeds on existing residential streets. While they often generate considerable opposition from drivers, public safety agencies, and service agencies, spe humps have repeatedly been shown to be effecti in reducing travel speeds by 5 to 10 mph on residential streets, and they are relatively inexpensive to install and maintain.

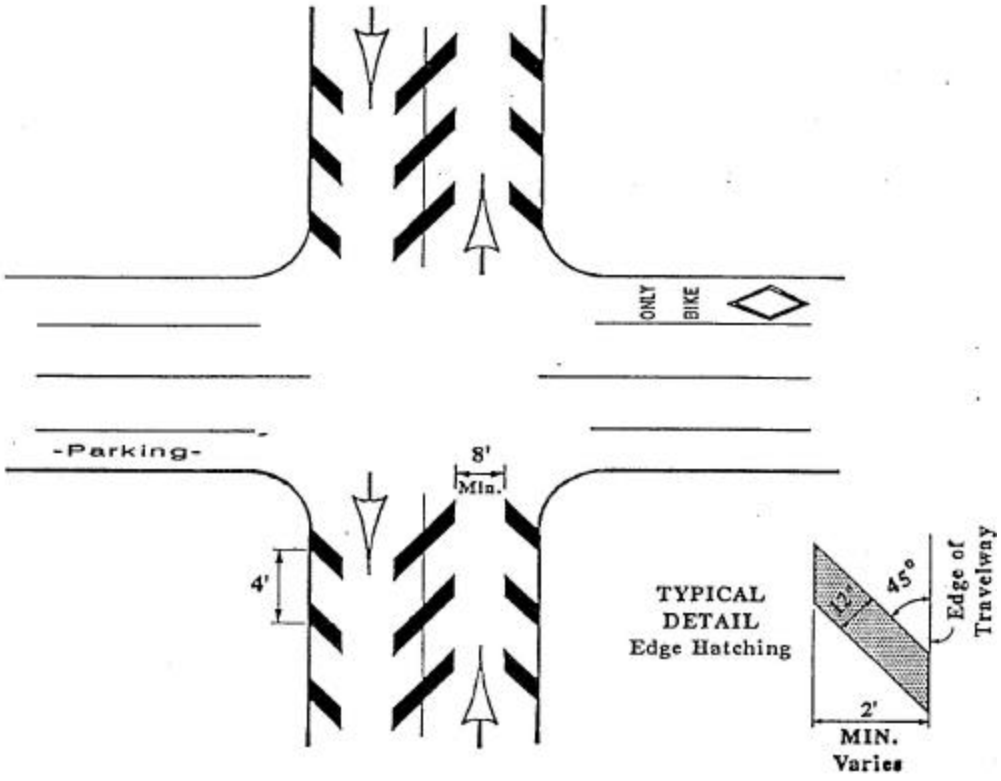
There is some evidence that over-use of speed humps can lead to negative reactions, especially from injured persons being transported, etc. Temporary removable speed humps made of Plastic or rubber should be used on a trial basis, Before permanent devices are installed.

SPEED TABLES
(3-4" X 22')
A Stage 2 Tool

Speed humps with a long flat section, often use crosswalks.



TRAFFIC CALMING DEVICE
Figure B-1. PHYSICAL DEVICE
PAVEMENT MARKING / LANE NARROWING



NOTES:

1. Markings shall be in accordance with the M.U.T.C.D. and V.D.O.T.'s Road and Bridge Standards and Specification manuals.

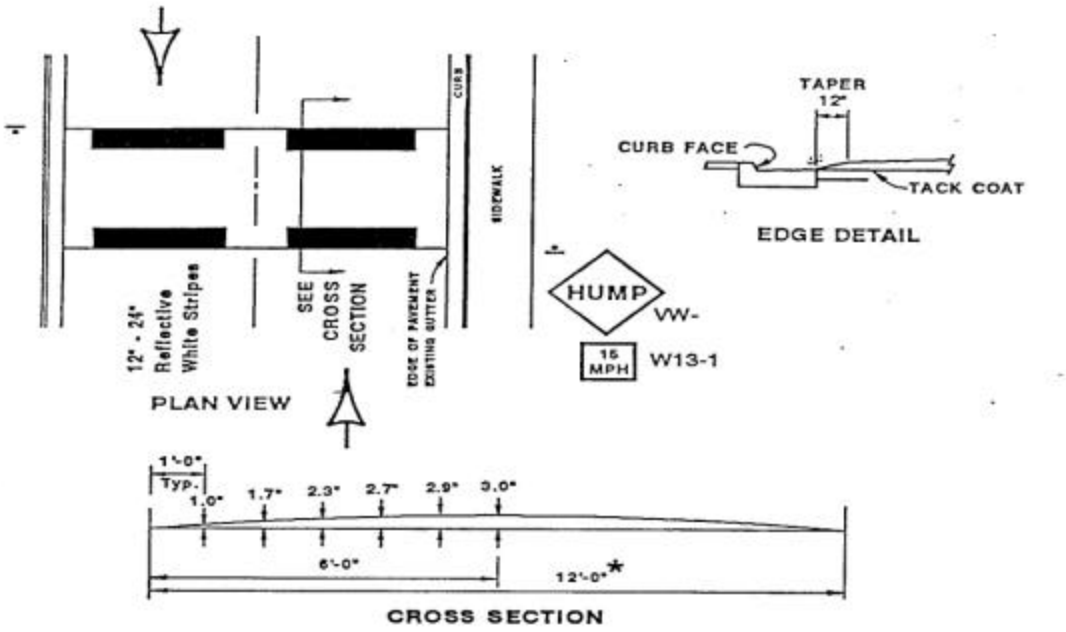
2. Narrowing Design Options:
   a) Hatching
   b) Parking Lanes
   c) Bike Lanes

3. The amount of hatching as well as widths, lengths and spacing to be determined by the Engineer. Centerline hatching optional.

4. Travel lanes not to be less than 8' in width.

5. Engineer to modify design to accommodate field conditions while conforming to AASHTO publications and acceptable engineering practices.

TRAFFIC CALMING DEVICE
Figure B-2. SPEED HUMP



NOTES:

1. Signs and Markings shall be in accordance with the M.U.T.C.D.

2. Advance signing, at each location, optional when part of an area wide scheme.

3. Cross-section shows approximate elevation for 3" (maximum) speed hump

4. Design Options:
   (a) 22' section (*) See Raised Crosswalk for cross-section.

5. Speed Humps shall not be placed over manholes, watergates, junction chambers, etc.

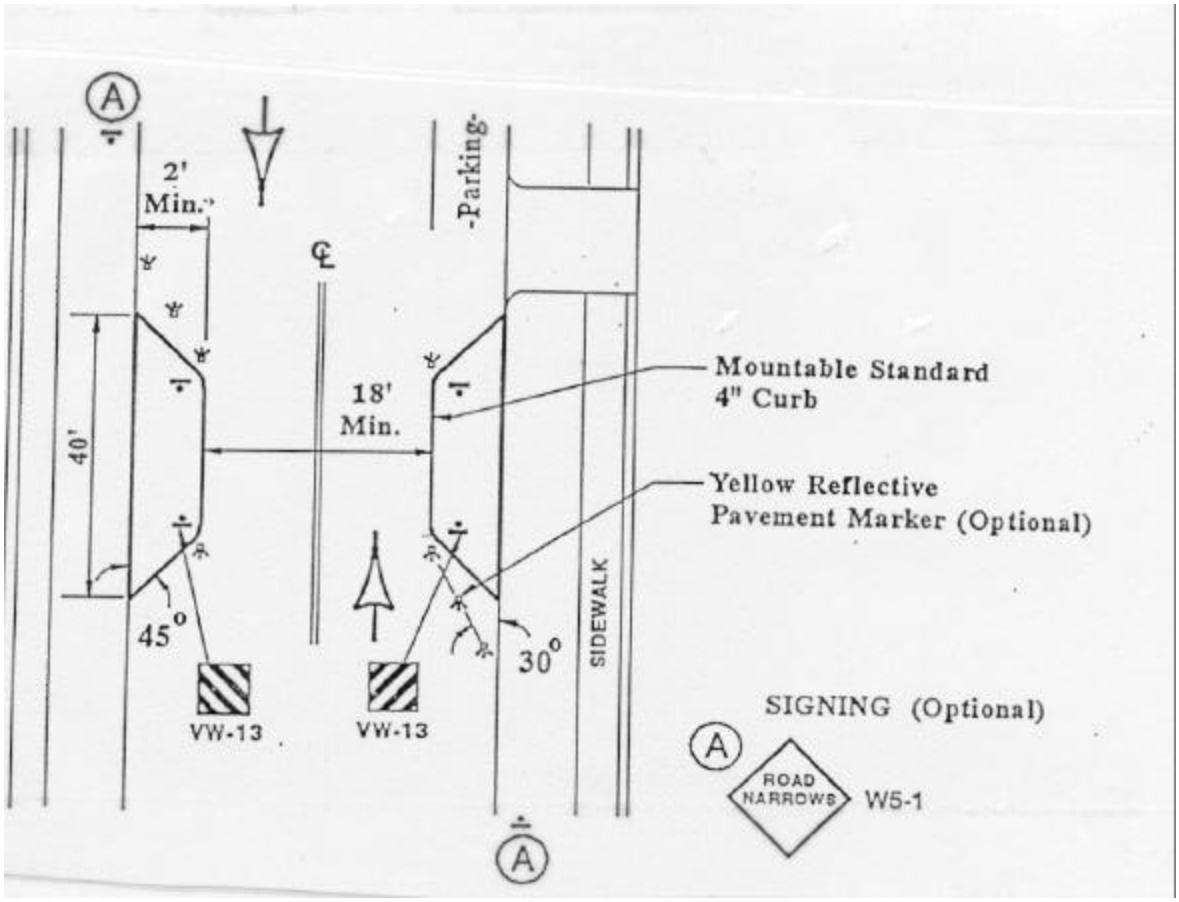
6. Speed Humps must be placed at locations approved by Engineer.

7. Engineer to modify design and location to accommodate field conditions (ex. Drainage) while conforming to VDOT's Road and Bridge Standards and Specification manuals, AASHTO publications and acceptable engineering practices.

8. Temporary rubber or plastic removable speed humps should be used on a trial basis before permanent devices are installed.

TRAFFIC CALMING DEVICE

Figure B-3 CHOKER



NOTES:

1. Signs and Markings shall be in accordance with the M.U.T.C.D.

2. Advance signing, at each location, optional when part of an area wide scheme.

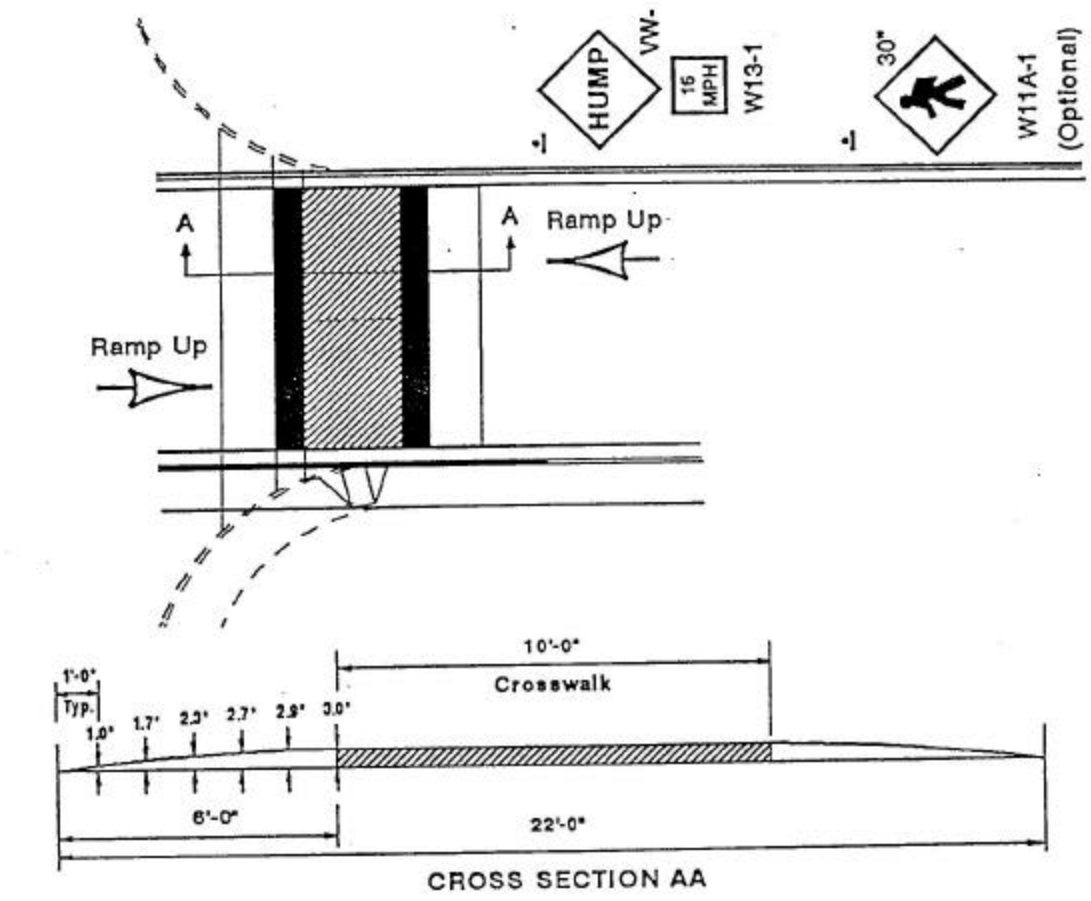
3. Landscaping designs, if any, to be determined by the community and approved by the Engineer.

4. Design Options:
   a) Intersection of Mid-block
   b) One-side or Two-side
   c) Combined with Raised Crosswalk

5. Engineering to modify design and location to accommodate field conditions (ex. Drainage) while conforming to VDOT'S Road and Bridge Standards and Specifications manuals, AASHTO publications and acceptable engineering practices.

TRAFFIC CALMING DEVICE

Figure B-4. RAISED CROSSWALK



NOTES:

1. Signs and Markings shall be in accordance with the M.U.T.C.D.

2. Cross-section shows approximate elevation for 3" (maximum) raised crosswalk

3. Design Options:
   a) Intersection or Mid-block
   b) Combined with Choker

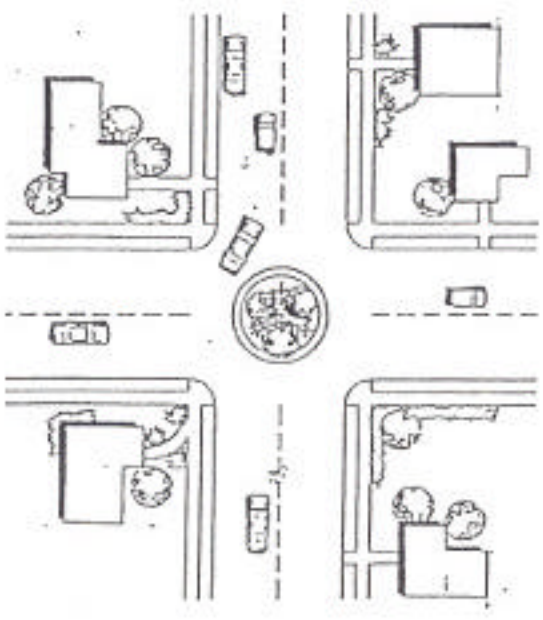
4. Raised Crosswalks shall not be placed over manholes, water gate valves, junction chambers, etc.

5. Raised Crosswalk material and placement to be approved by Engineer

6. Engineer to modify design to accommodate field conditions (ex. Drainage and curb cuts) while conforming to VDOT's Road and Bridge Standards and Specifications manuals, AASHTO publications and acceptable engineering practices.

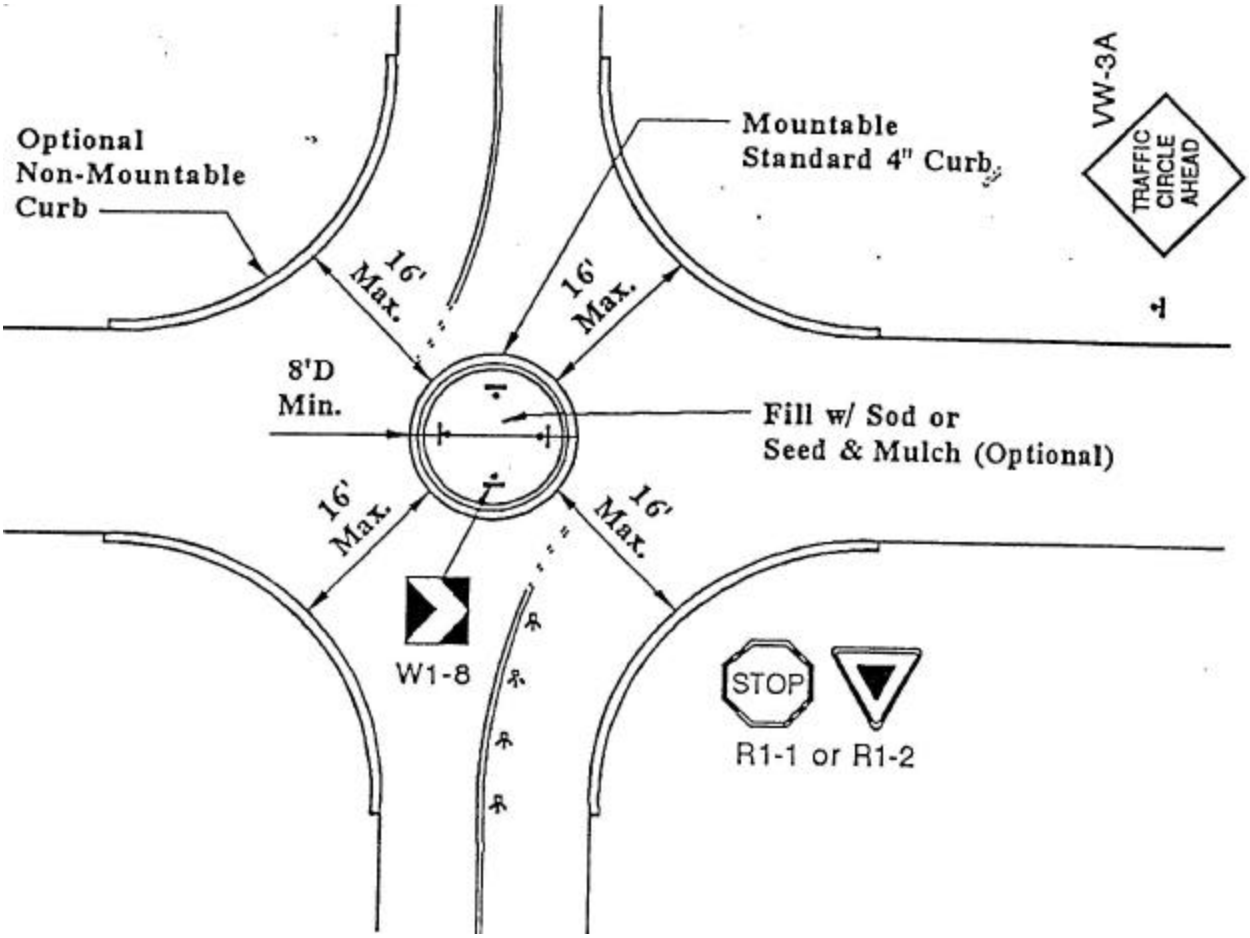
Traffic Circles
A Stage 2 Tool

This devise is a circle in the middle of two intersecting routes. The central island, causing traffic to move around the circle in a one-way pattern obstructs direct straight-through movements "YIELD" signs normally control approaches to the intersection area. Their primary purpose is to slow high-speed traffic. They also reduce the number of reported accidents. Traffic circles are not effective when constructed in a series.



TRAFFIC CALMING DEVICE

Figure B-5 TRAFFIC CIRCLE



NOTES:

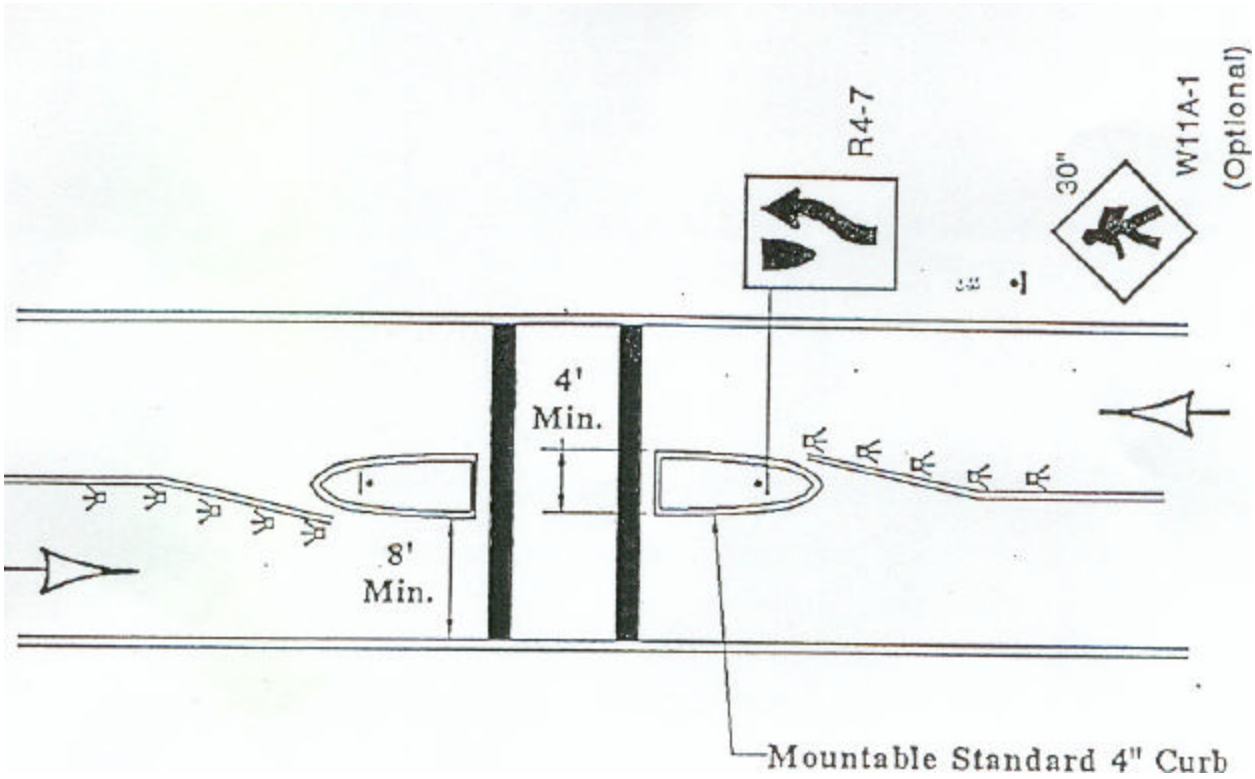
1. Signs and Markings shall be in accordance with the M.U.T.C.D.

2. Landscaping designs, if any, to be determined by the community and approved by the Engineer.

3. Engineer to modify design to accommodate field conditions (ex. Drainage) and available ROW while conforming to VDOT's Road and Bridge Standards and Specification manuals, AASHTO publications and acceptable engineering practices.

TRAFFIC CALMING DEVICE

Figure B-6. CROSSWALK REFUGE



NOTES:

1. Signs and Markings shall be in accordance with the M.U.T.C.D.

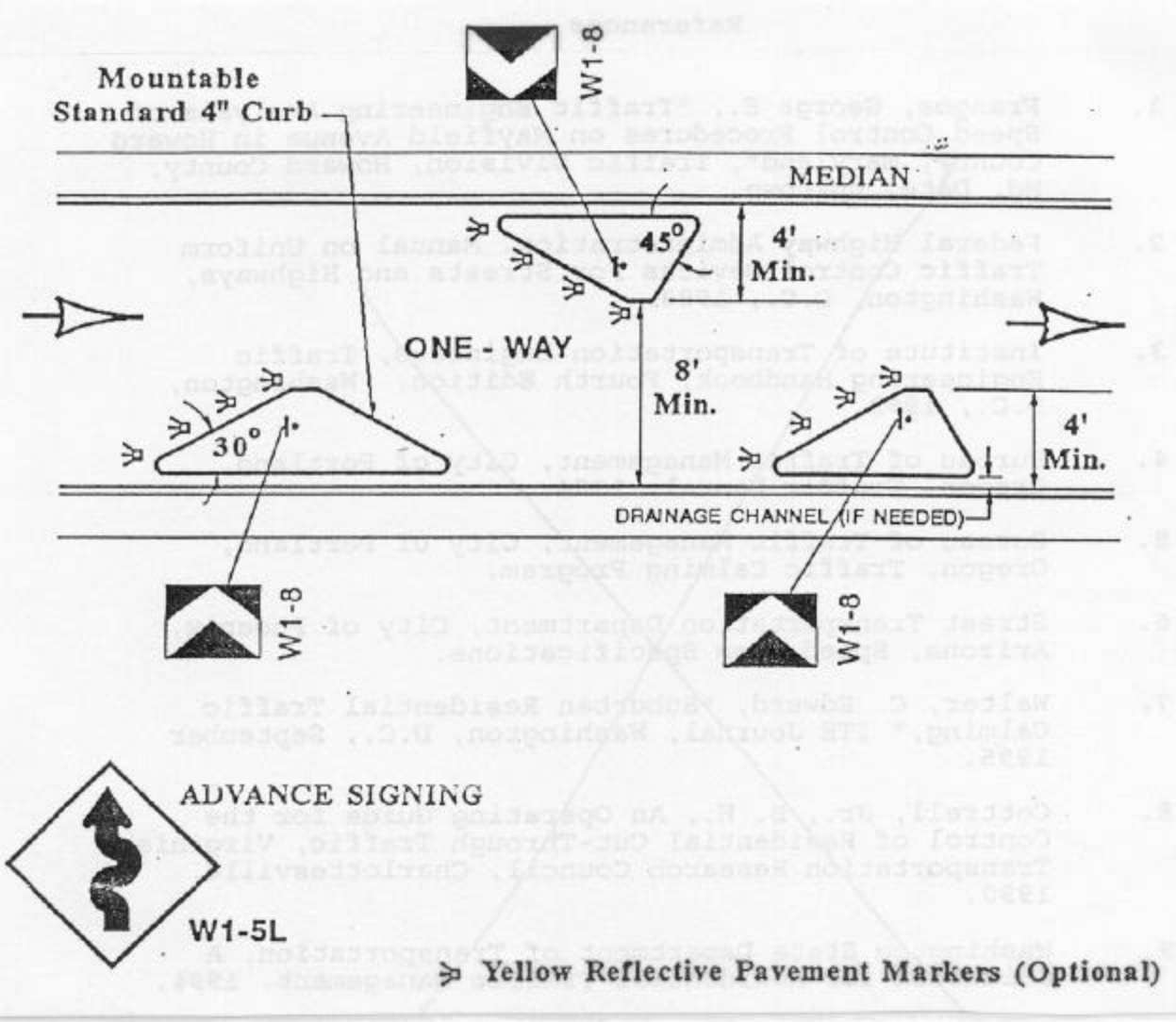
2. Cross-section shows approximate elevation for 3” (maximum) raised crosswalk

3. Design Options:
c) Intersection or Mid-block
d) Combined with Choker

4. Engineer to modify design to accommodate field conditions (ex. Drainage) and available ROW while conforming to VDOT’s Road and Bridge Standards and Specification manuals, AASHTO publications and acceptable engineering practices.

TRAFFIC CALMING DEVICE

Figure B-7. CHICANE



NOTES:

1. Signs and Markings shall be in accordance with the M.U.T.C.D.

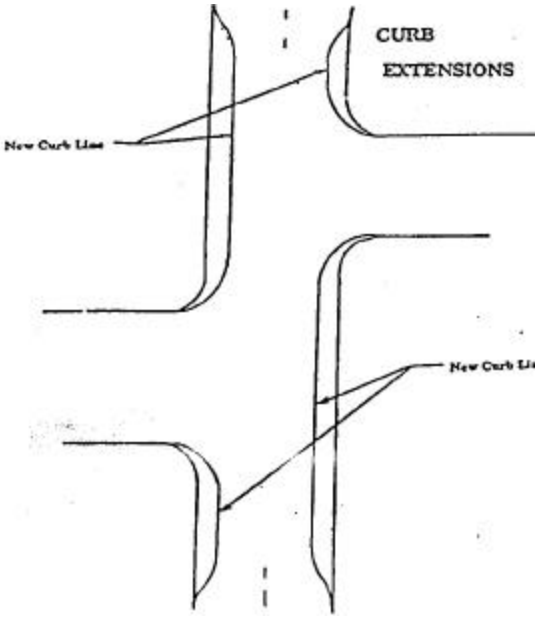
2. Landscaping designs, if any, to be determined by the community and approved by the Engineer.

3. Engineer to modify design to accommodate field conditions (ex. Drainage) and available ROW while conforming to VDOT's Road and Bridge Standards and Specification manuals, AASHTO publications and acceptable engineering practices.

OPTIONAL DEVICES THAT MAY BE CONSIDERED

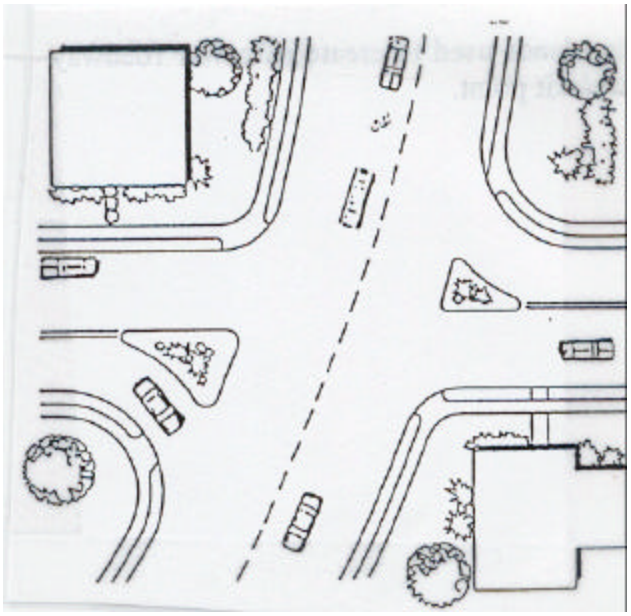
CURB EXTENSIONS
(Entry, Exit, Mid-Block)
A Stage 2 Tool

Curb extensions narrow the street by widening the sidewa and/or the landscaped parking strip. They are used to mak pedestrian crossings easier and to provide a visual narrowing along the roadway that helps increase driver awareness. They can be installed either at intersections or mid-block.



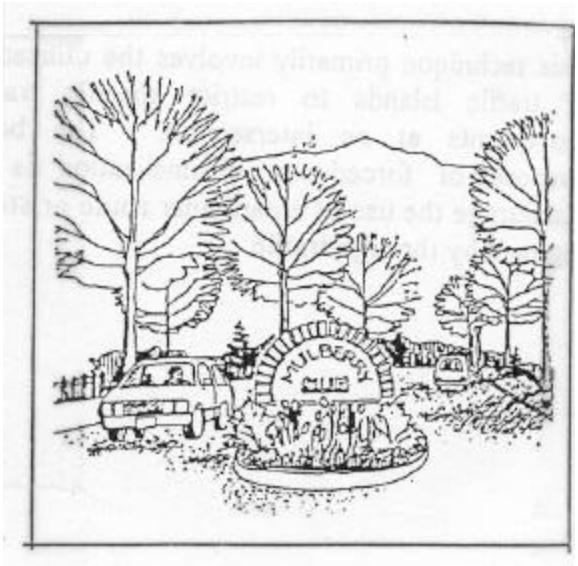
FORCED-TURN ISLANDS, BARRIERS, CHANNELIZATION
A Stage 2 Tool

This technique primarily involves the utilization of traffic islands to restrict specific traffic movements at an intersection. The basic purpose of forced-turn channelization is to discourage the use of a particular route or street segment by through traffic.



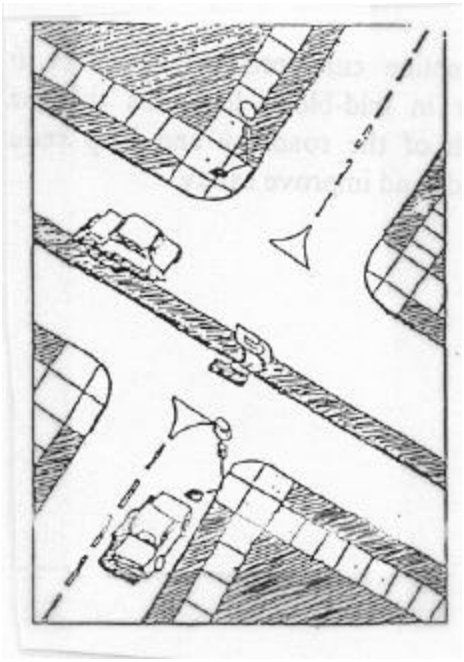
MEDIAN ENTRY/EXIT ISLANDS
A Stage 2 Tool

Traffic islands used to create narrower roadway at entry/exit point.



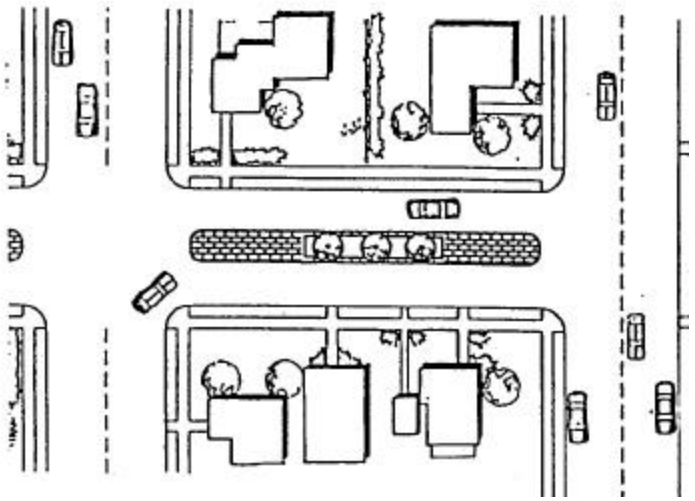
MEDIAN BARRIERS
A Stage 2 Tool

A median barrier (raised median) is used at the intersection of a major and a minor street to prevent left turns to and from the minor street, in addition to through movements across the major street.



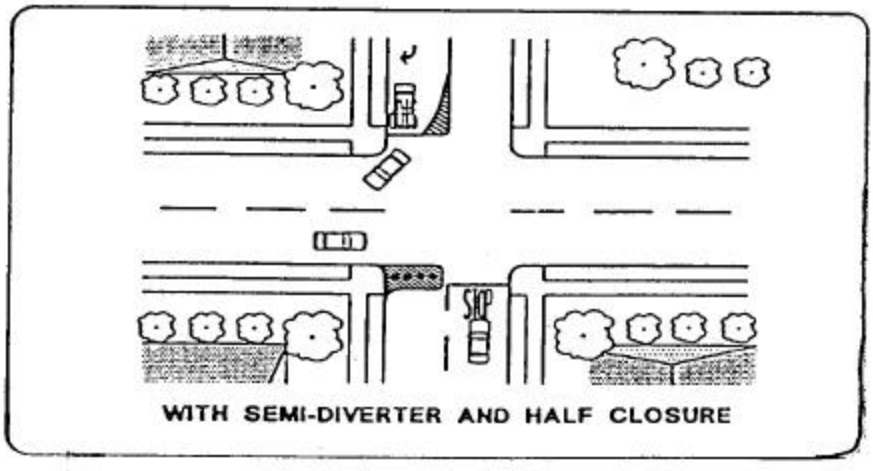
MEDIAN MID-BLOCK ISLANDS
A Stage 2 Tool

Traffic islands between intersections to create a r
roadway or provide refuge for crossing pedestria



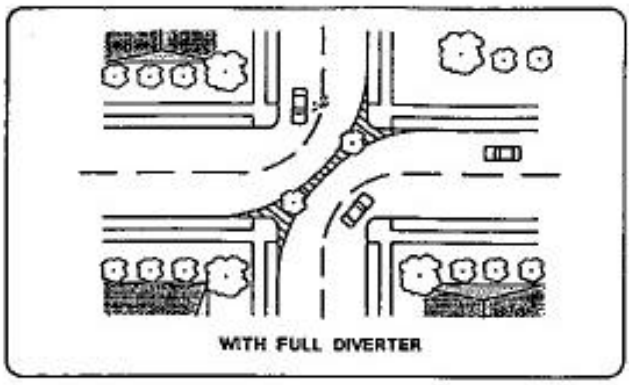
ONE-WAY ENTRY/EXIT CHOKERS, HALF-CLOSURES, SEMI-DIVERTERS
A Stage 2 Tool

A semi-diverter is a barrier to traffic in one direction of a street that permits traffic in the opposite direction to pass through. In a sense, it is a physical reinforcement to a regulatory "Do Not Enter" sign and is normally accompanied by such a device, as well as by-turn prohibition signs on the crossing street. It is an alternative to using a one-way street designation for the same block, and allows residents on the block limited two-way travel opportunity.



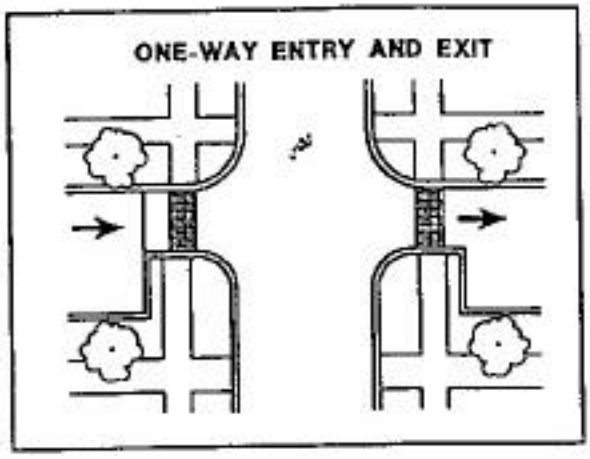
DIAGONAL DIVERTERS
A Stage 2 Tool

A diagonal diverter is a barrier placed diagonally across an intersection that prevents traffic from continuing straight through and forces motorists to make a sharp turn. Its purpose is to block a major cut-through neighborhood and make travel through a neighborhood difficult without actually preventing it. most effective when used in a pattern of similar diverters. Caution: Careful consideration should be given to maintain safe traffic flow at reduced speeds as well as access for emergency vehicles around these "sharp curves".



ONE-WAY STREETS AND SIGNS
A Stage 2 Tool

Standard R10 (Right) and R10 (Left) signing to design street or streets or segments of streets as "one way," sometimes in a maze to deliberately deter through movements.



APPENDIX III

REQUEST FOR TRANSPORTATION AUDIT

City of Harrisonburg
Public Works Department
320 E. Mosby Road
Harrisonburg, VA 22801

Out of concern for the vehicular behaviors present on our street of 25 mph or less, the residents of _____ submit this petition to the City of Harrisonburg for active consideration under the Neighborhood Street Calming Plan. We understand that the City will, upon receipt of a valid majority (75% approval) petition, analyze relevant conditions to determine the impact of the proposed action. The City must reserve the right to overrule the petition if there are extenuating circumstances detrimental to public safety, traffic operations, and/or neighborhood interests

NOTE: If physical devices are recommended, approved by second petition and installed as a result of this study and later deemed unwanted by the affected community, the responsibility for the cost of removal of these devices may be the responsibility of the property owners.

We have received _____ approval signatures out of _____ residents, thus satisfying the 75% needed

PETITION CIRCULATOR – SIGNATURE:	**ADDRESS/PHONE:**
_____	_____
SIGNATURE:	**ADDRESS/PHONE:**
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

SIGNATURE: **ADDRESS/PHONE:**

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